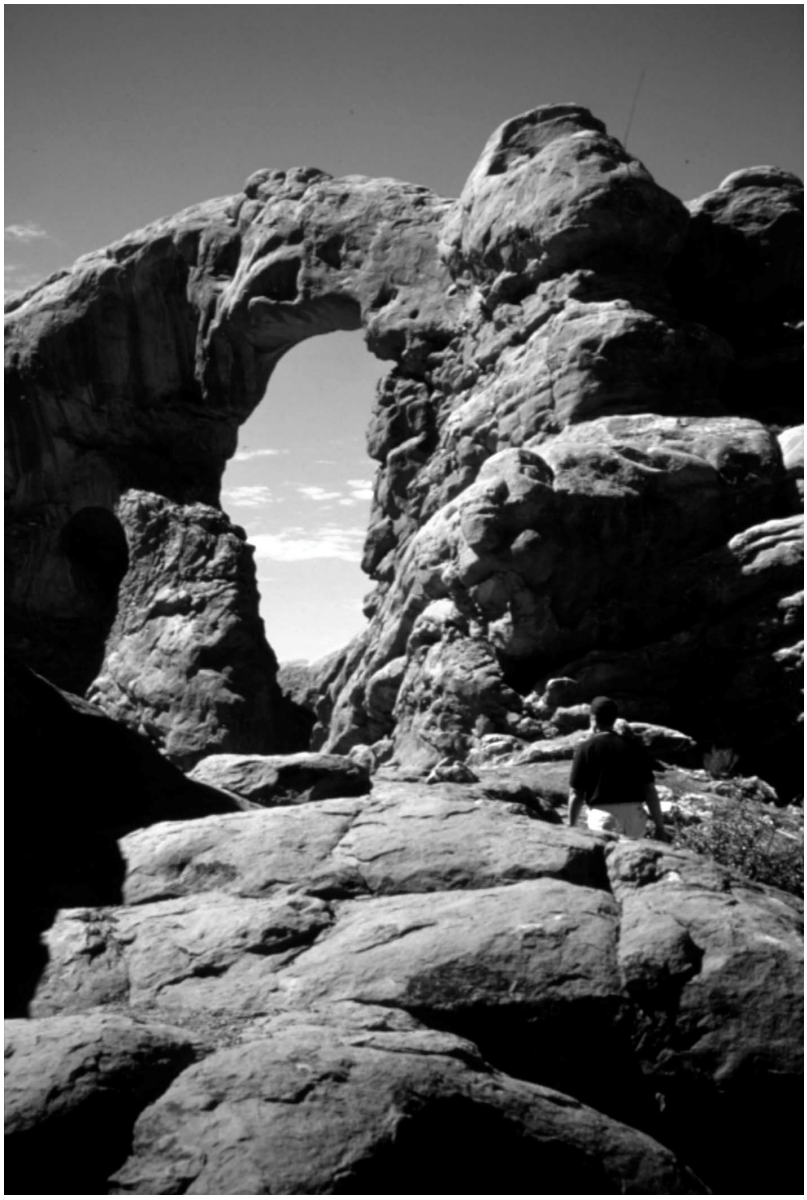
Field Report
Arches National Park

1.0 Summary



Arches National Park contains one of the largest concentrations of natural sandstone arches in the world. The arches and numerous other extraordinary geologic features, such as spires, pinnacles, pedestals, and balanced rocks, are highlighted in striking foreground and background views created by contrasting colors, landforms and textures. Arches National Park was established as a National Monument on April 12, 1929. The goal was to "protect extraordinary examples of wind erosion in the form of gigantic arches, natural bridges, 'windows', spires, balanced rocks and other unique wind-worn sandstone formations, the preservation of which is desirable because of their educational and scenic value." The park is over 73,300 acres in size and is located in southeast Utah off of Utah State Highway 191, five-miles north of the City of Moab, Utah.

In 1997, over 858,000 persons visited the park and in 1998, over 837,000 persons visited the park. Between 1988 and 1998, the visitation to Arches National Park increased by 60 percent. The number of visitors is estimated to continue to increase especially with the approaching 2002 Winter Olympics in Salt Lake City. The basic road tour with stops at overlooks and viewpoints requires approximately three to four hours.

With only one entry/exit point off of Highway 191 and the number of visitors coming to Arches increasing every year, the park appears to be a strong candidate for the introduction of an Alternative Transportation Systems (ATS). An ATS operation at Arches National Park appears to be justified for both transportation impact mitigation and resource protection. Feasible ATS alternatives for Arches National Park include:

- A system of continuous and safe bike lanes and/or paths linking the City of Moab with the recreation uses along Route 128, Highway 191, Arches National Park, and the Moab Recreational Area administered by the BLM;

- The development of bike lanes within Arches National Park along the main park roadway;

- A regular route or on-demand transit service from the City of Moab to the Arches National Park access point along Highway 191; and

- A regular route or on-demand transit service that penetrates Arches National Park from the Visitor Center at the access point along Highway 191 into the park which stops at both major and minor sandstone formation attractions.

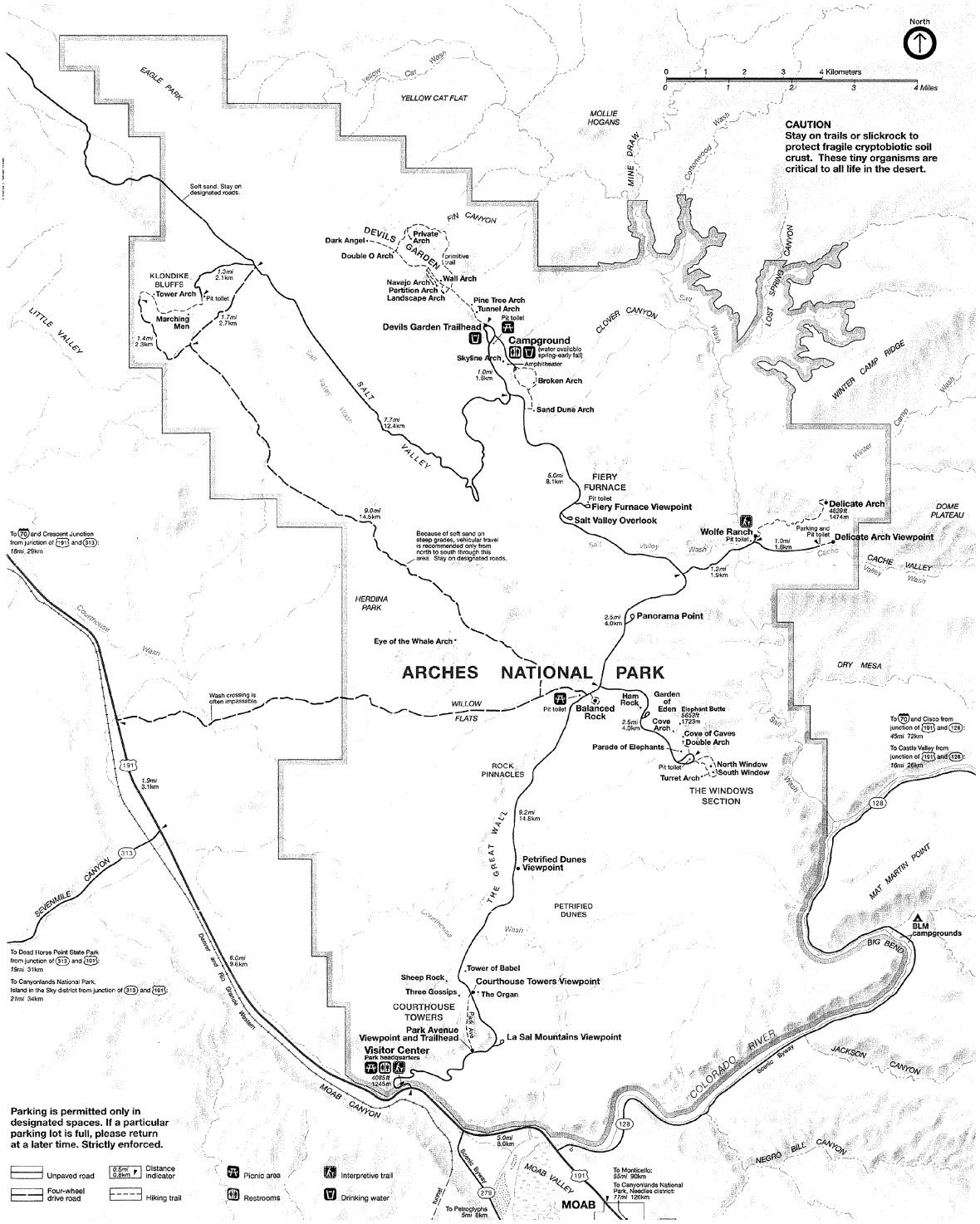
2.0 Background Information

2.1 Location

Arches National Park is located approximately five-miles north of the City of Moab in southeast Utah. The current population of the City of Moab is 4,480 persons, a significant decrease from the 1990 U.S. Census population of 6,200 persons. Additionally, the current population of Grand County is 8,800 persons. Access to Arches National Park is from the south end of the park on State Highway 191. The park roadway is the only paved road

into the park. Access to Arches National Park can also be gained via off-road vehicle trails from the west side of the park. Figure 1 displays the park location and boundaries of the park.

Figure 1. Map of Arches National Park



2.2 Administration and Classification

Arches National Park is managed by the Department of Interior's NPS. The Acting Superintendent for the Southeast Utah Group, which Arches National Park is part of, is Philip R. Brueck.

2.3 Physical Description

Arches National Park is a high-desert area with rough terrain and a multitude of rock formations. The key physical characteristics related to transportation are:

- Access to the park is via a single two-lane road with the entrance/exit on the south side of the park; and

- The existing road through the park is narrow with no shoulder along much of its length. Because of the rugged terrain and rock formations the road passes through, widening and straightening the roadway would be a difficult, if not impossible, task.

2.4 Mission and Goals of Arches National Park

Arches National Park was established as a National Monument on April 12, 1929. The goal was to "protect extraordinary examples of wind erosion in the form of gigantic arches, natural bridges, 'windows', spires, balanced rocks and other unique wind-worn sandstone formations, the preservation of which is desirable because of their educational and scenic value." Through the years, the National Monument was enlarged geographically by presidential proclamations until November 12, 1971, where an act of Congress changed the National Monument to a National Park.

The mission of Arches National Park is the "Protection and Preservation of the natural environment to ensure the ecosystem integrity while providing for visitor enjoyment." Preservation and Protection is not limited to only the natural environment. Preservation and Protection extends to include natural, cultural, and recreation management.

2.5 Visitation Levels and Visitor Profile

From 1988 to 1998, Arches National Park visitation increased by 60 percent. Visitation climbed from 520,455 visitors in 1988 to 837,161 visitors in 1998. According to a 1993 visitor use survey, 67 percent of these users are domestic users, 33 percent are foreign visitors. Of the 33 percent foreign visitors, 15.8 percent of the total visitors were from Germany.

The average visitor spent 2.92 days in the Moab area. Most visitation to Arches National Park occurs during the months of May through September, with visitor numbers declining sharply during the winter months.

3.0 Existing Conditions, Issues and Concerns

3.1 Transportation Conditions, Issues and Concerns

The prime transportation issue for Arches National Park is how to adequately accommodate the increase of visitation. The average daily usage was 2,294 users in 1998 with a peak use of 3,882 daily users recorded in July 1998. A majority of the users come to Arches from Moab, crossing over the Colorado River bridge bottleneck. Very few users use alternative transportation, such as tour buses. All counted users pass through the south entrance to the park. There is no public transportation from Moab to Arches National Park.

The transportation concern for Arches National Park is to accommodate the increasing number of users while at the same time creating a positive visitor experience and preserving the resources of the park. Parking areas are overloaded at peak-visitation times, creating unauthorized parking which has the potential of destroying fragile crytobiotic soils and native vegetation. Overcrowding at sites also creates a negative visitor perception. In high-use areas such as the Devil's Garden trail 25 percent to 40 percent of the users felt that they were moderately to severely crowded. Staff at Arches National Park believe that because of growing use levels, some visitors no longer revisit the park.

Arches National Park has experienced dramatic growth in visitors in the last decade. Because the park entrance and roadway system were designed to accommodate much less traffic than occurs now, there is overcrowding and congestion. In summer months, vehicles are queued up on Highway 191, the major highway to Moab, creating a dangerous situation because of lack of stacking distance on the highway caused by long lines at the single-lane fee collection booth. Average daily roadway volumes in 1995 in the vicinity of Arches National Park were moderately high but did not significantly place the roadways at a capacity deficiency level. The 1995 Average Annual Daily Traffic (AADT) volumes on State Highway 191 were 5,530 vehicles at the northern city limits of Moab; 4,990 vehicles at the junction of the Colorado River and State Route 128; and 2,570 vehicles at the access road to Arches National Park. Additionally, the AADT volumes on State Route 128 near the junction of Highway 191 were 695 vehicles in 1995. The traffic queuing problems at the park access point is illustrated in Figure 2.

Although the traffic volume levels are not high and the roadway level of service is operating in the area of "B," the geometry and grade of Highway 191 is deficient in terms of allowing park visitors to safely access Arches National Park. Furthermore, the Highway 191 Colorado River Bridge is deficient because of the lack of shoulders on the bridge and the high number of trucks operating along Highway 191. A review of traffic counts reveal that the percent of trucks operating along Highway 191 is in the area of 15 percent to 20 percent. This is significantly higher than the national and state averages of five percent to nine percent of trucks operating along major highways. This roadway and bridge deficiency is further heightened when persons riding bicycles along Highway 191 are factored into the capacity deficiency analysis. There is a moderate to high number of bicyclists who use Highway 191 to access Arches National Park, the biking trails along Highway 191, and the biking trails along State Route 128.

Figure 2. Fee Collection Booth at the entrance of Arches National Park

Currently, there are plans to realign the access to Arches National Park to provide more queuing distance and add another fee collection lane at the entrance station to allow quicker pass-through of visitors.

Congestion at pull outs and parking areas within the park are also a great concern as shown in Figure 3.

Many of the more popular sites are operating at capacity on a daily basis. The Windows Arch, Wolf Ranch, Sand Dune Arch, Devil's Garden Trailhead, and Balanced Rock areas have been identified as overused and congested areas. The Visitor Center parking area is sometimes over-utilized, areas that are presently under-utilized include the Delicate Arch Viewpoint, Double Arch, the Salt Valley Overlook, and the Panorama Viewpoint. Areas where it is perceived that the visitor use is satisfactory include Park Avenue, La Sal Mountain Overlook, Fiery Furnace, Skyline Arch, Garden of Eden, and Courthouse Towers. A windshield survey of parking facilities was taken during the site visit over the Labor Day holiday weekend. The results are shown in Table 1 for existing parking supply within Arches National Park.

Figure 3. A Typically Full Parking Lot at Devil's Kitchen

Table 1. Existing Parking Supply at Arches National Park (September 1999)

Parking Location	Number of Parking Spaces	Parking Location Roadway Direction (Inbound/Outbound)	Mile Point from Park Entrance
Parking Supply from Park Entrance to Windows Spur Road			
Visitor Center	80 and 4 Handicap	Inbound	0.2
Pull Out Area	3	Inbound	0.7
Moab Fault Viewpoint	12	Inbound	1.4
Park Avenue Viewpoint and Trailhead	40	Outbound	2.4
Pull Out Area	12	Inbound	2.6
La Sal Mountains Viewpoint	25	Inbound	2.7
Pull Out Area	2	Inbound	3.5
Courthouse Towers Viewpoint	25	Inbound	3.7
Pull Out Area	8	Outbound	4.7
Petrified Dunes Viewpoint	5	Inbound	6.1
Pull Out Area	30	Inbound	7.3
Pull Out Area	2	Inbound	8.0
Pull Out Area	2	Inbound	8.6
Balanced Rock	8	Inbound	9.0
Parking Supply Subtotal	**254 and 4 Handicap**		
Parking Supply on Windows Spur Road			
Pull Out Area	5	Outbound	0.3
Pull Out Area	3	Outbound	0.5
Pull Out Area	3	Outbound	0.7
Garden of Eden	12	Outbound	1.1
Cove of Caves Viewpoint	3	Outbound	2.0

Table 1. Existing Parking Supply at Arches National Park (September 1999) (continued)

Parking Location	Number of Parking Spaces	Parking Location Roadway Direction (Inbound/Outbound)	Mile Point from Park Entrance
Parking Supply on Windows Spur Road (continued)			
Windows Main Parking Area	38 and 2 Handicap	End of Roadway	2.5
Windows Additional Parking Area	55	End of Roadway	2.5
Parking Supply Subtotal	**119 and 2 Handicap**		
Parking Supply from Windows Spur Road to Delicate Arch Spur Road			
Panorama Point	25	Inbound	1.0
Pull Out Area	10	Inbound	1.5
Pull Out Area	5	Outbound	1.9
Pull Out Area	5	Inbound	2.3
Parking Supply Subtotal	**45**		
Parking Supply on Delicate Arch Spur Road			
Wolfe Ranch Main Parking Area	52 and 2 Handicap	Outbound	1.2
Wolfe Ranch Oversize Parking Area	10	Inbound	1.2
Delicate Arch Viewpoint Parking Area	75 and 5 Handicap	End of Roadway	2.2
Parking Supply Subtotal	**127, 10 Oversize, and 7 Handicap**		
Parking Supply from Delicate Arch Spur Road to Devils Garden Trailhead			
Pull Out Area	12	Inbound	1.1
Salt Valley Overlook	15	Inbound	1.9
Fiery Furnace Viewpoint	20	Inbound	2.9
Pull Out Area	10	Inbound	3.4
Pull Out Area	15	Outbound	3.6
Pull Out Area	10	Inbound	3.7
Pull Out Area	5	Inbound	3.8
Pull Out Area	5	Inbound	3.9
Pull Out Area	10	Outbound	4.0
Sand Dune Arch Trailhead	20	Inbound	4.2
Skyline Arch Trailhead	15	Inbound	4.3
Devils Garden Trailhead Picnic Area	10 and 2 Handicap	Inbound	4.8
Devils Garden Trailhead, south of campground entrance	10	Inbound	4.9
Devils Garden Trailhead, between campground and trailhead	56	End of Roadway	5.0
Devils Garden Trailhead, between trailhead and service road	82 and 4 Handicap	End of Roadway	5.0
Parking Supply Subtotal	**295 and 6 handicap**		
Grand Total of Parking	**840 Stalls** **19 Handicapped Stalls** **10 Oversized Stalls**		

Source: BRW, Inc.

There is also concern about the connection between the City of Moab and Arches National Park. Highway 191 crosses the Colorado River between the City of Moab and the entrance to Arches National Park. This creates a bottleneck and makes safety an issue for non-motorized traffic. Since this is the only crossing of the Colorado River, bicyclists are forced to use the narrow two-lane bridge with heavy truck and car traffic. Bicycle use is very heavy in this area and this river crossing is the only way to get to popular trails north of the City of Moab.

Bicycling

Although the paved route through the park is a very scenic roadway, bicycling is very dangerous along this road because of the heavy volume of traffic, limited sight distances around curves, and lack of shoulders in many areas. Because of the great amount of grade change on the roadway in the park, the roadway would be a challenge to the average cyclist. In addition, Highway 191 from the City of Moab to the Arches National Park access roadway is dangerous for bicyclists because of the bottleneck at the Colorado River Bridge, high traffic speeds, roadway volumes, and poor sight lines.

3.2 Community Development Conditions, Issues and Concerns

The economy of the City of Moab has evolved from primarily a mining town to a town whose major economy is based on tourism. Moab and the surrounding area have much to offer in the way of outdoor activities including mountain biking, river rafting, off-road vehicle use, hiking, and sight-seeing.

Local leaders are aware of the symbiotic relationship that the town has with Arches National Park and other surrounding federal lands. It is a major tourism hub for the area. Since none of the lands surrounding Moab have services other than primitive camping, Moab provides services such as hotels, restaurants, guide services, and shopping. Because there is a close relationship between Moab and the surrounding federal lands, the City is interested in examining how to better their town with alternative transportation to the federal lands in the form of bicycle lanes, bus systems, shuttles to specific sites, and other alternative transportation solutions.

3.3 Natural or Cultural Resource Conditions, Issues and Concerns

If not managed properly, there can be negative impacts to natural and cultural resources because of transportation. Some locally identified concerns are:

- Concern for destruction of native vegetation and fragile cryptobiotic soils because of overuse and lack of public education;
- Protection of Petroglyphs from vandalism; and
- Protection of winter Desert Big Horn Sheep habitat near the entrance to the park.

3.4 Recreation Conditions, Issues and Concerns

The goal of the park is to balance the needs and experiences of the visitor with the preservation and conservation of the natural and cultural resources within the park. Several issues include:

- Overcrowding of popular sight-seeing areas;
- Accommodating different types of users while protecting natural resources; and
- Developing a safe, efficient entryway to the park.

4.0 Planning and Coordination

4.1 Park Plans

Arches National Park is planning to reconfigure the entrance to the park to make a safer and more efficient access to the park. In addition, a study has been initiated to analyze all the pullouts along the park road to assess the needs and uses of these facilities. At the existing Balanced Rock pullout, the park staff will be removing the pullout and replacing it with a parking lot that will accommodate about 15 automobiles and four buses. This work will be completed by December 1999. The park staff would like to widen the roadway and provide a shoulder for bicyclists, however at this time no funding is available for this improvement. No alternative transportation plans have been studied or implemented, but the need for alternative transportation is recognized by park staff and the community.

4.2 Public and Agency Coordination

Through interagency cooperation and with the assistance of the City of Moab, the Moab Information Center in the heart of downtown Moab was recently constructed. The center was created in order that visitors to the area could receive information at one central location.

5.0 Assessment of Need and System Options

5.1 Magnitude of Need

There appears to be a significant need for ATS services at Arches National Park. Alternative transportation could serve as a link between Arches National Park and the town of Moab, cutting down the bottleneck at the Colorado River Bridge. In addition, alternative transportation may enhance the visitor experience within the park by relieving congestion

at major attractions. Finally, by providing ATS to visitors of Arches National Park the current vehicle access and associated parking problems could be slightly to moderately relieved.

5.2 Range of Feasible Transit Alternatives

There a number of feasible transit alternatives that would assist in providing an excellent visitor experience as well as facilitating the efficient and safe movement of vehicles into and through Arches National Park.

- Improving the access roadway Visitor Center fee station and allowing for more queuing of vehicles off of Highway 191.

- Providing continuous and safe bike lanes or paths from the City of Moab along Route 128 to Arches National Park and continuing north along Highway 191.

- Upgrading the Arches National Park internal roadway to provide for the safe movement of bicycles along the roadway. This could possibly be a paved shoulder to allow motorized vehicles to pass safely around bicycles.

- Initiating regular transit service from the City of Moab (possibly near the Moab Information Center) to the park entrance where the transit vehicle could either continue into the park or transfer transit riders to another transit vehicle which would then continue into the park.

- If regular transit service is initiated, set policy direction on how the transit service would be operated and what areas within the park the transit service would provide access.

- If regular transit service is initiated, provide transit shelters at the major viewing areas within the park.

- Come to an agreement through interagency coordination about the possibility of providing a north or west access point into Arches National Park.

- Review guidelines and set policy regarding the possibility of shutting the entrance gates and not allowing additional visitors to access the park once the park has reached a certain level of attendance for a specific day when visitation to the park is high.

5.3 General Transit System Considerations

Any transit system within Arches National Park should:

- Introduce the bicycle and transit system gradually with a maximum of public information, education and support;
- Design the transit vehicles specifically to accommodate large parties carrying backpacks and supplies for hiking to scenic viewpoints;
- Design the system to meet peak-hour demands of entry and exit of Arches National Park in order to encourage ridership and maintain the quality of the visitor experience;
- Include an interpretive narrative by the driver or have a park staff member on the transit vehicle to provide a narrative of park attractions;
- Utilize new technology to inform transit riders of the timing of the next transit vehicle arrival, the number of persons accessing each site, and other information that would enhance the visitor experience;
- Include attractive signs and maps indicating the route of the transit vehicle and the times of arrivals and departures of the vehicle;
- Utilize fuel that minimizes offensive odors and utilize a vehicle that is quiet;
- Include transit shelters in order to provide shade and protection from the weather;
- Provide basic refreshment and comfort facilities at the transit shelters;
- Include bicycle racks on the transit vehicles; and
- Integrate the park transit service with any transit service that may be arriving from the City of Moab.

6.0 Bibliography

Arches National Park. 1989. *General Management Plan/Development Concept Plan/ Environmental Assessment.* Approved by the Rocky Mountain Regional Director August 1989.

Arches National Park. 1995. *Visitor Experience and Resource Protection Implementation Plan (VERP).* Approved by the Superintendent of Arches National Park May 1995.

Arches National Park. 1993. *Visitor Use Survey*.

7.0 Persons Interviewed

Wayne Nielson, Jim Webster, and Philip Brueck, Arches National Park Staff

Kirsten Peterson, Rim Tours

Dale Peterson, Utah Department of Transportation